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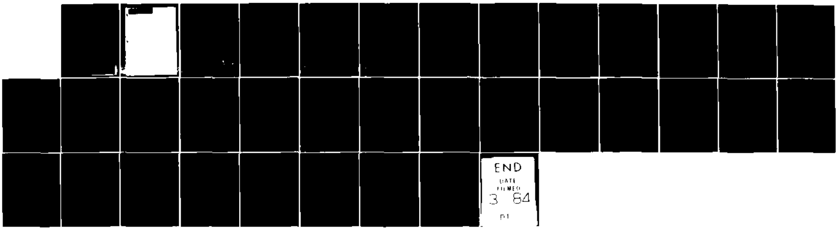

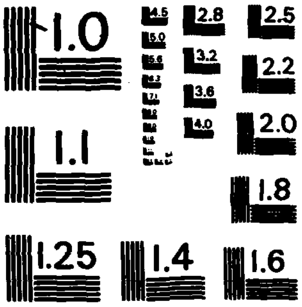

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A COMPUTER COMPATIBLE SYSTEM FOR THE CATEGORIZATION, ENUMERATION, AND RETRIEVAL OF NINETEENTH AND EARLY TWENTIETH CENTURY ARCHAEOLOGICAL MATERIAL CULTURE

by Randolph E. Donahue

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This report presents a system for classifying nineteenth century and early twentieth century material culture from archaeological contexts. It consists of three parts, a codebook, a codebook manual, and a computer software package. The codebook provides a system for classifying artifacts and artifact fragments according to material of manufacture and form, organized to segregate material, style, and manufacturing techniques of functional and chronological significance. The codebook manual contains instructions for making critical classification decisions as well as illustrations and references to facilitate the process. The software manual is not compatible with the current version of the codebook but provides an illustration of the utility of computer assisted enumeration and retrieval.

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Abstract

This report presents a system for classifying nineteenth century and early twentieth century material culture from archaeological contexts. It consists of three parts, a codebook, a codebook manual, and a computer software package. The codebook provides a system for classifying artifacts and artifact fragments according to material of manufacture as well as form, organized to segregate material, style, and manufacturing techniques of functional and chronological significance. The codebook manual contains instructions for making critical classification decisions along with illustrations and references to facilitate the process. The software manual is not compatible with the current version of the codebook but is an illustration of the utility of computer assisted enumeration and retrieval.

Preface and Acknowledgements

Recognizing that the excavation at the extinct nineteenth century townsites of Colbert, Barton and Vinton, Mississippi would result in a huge return of artifacts, as well as complex data manipulation problems representative from the Tombigbee Historic Townsites Project, the Park Service-Mid Atlantic Region and the Corps of Engineers-Mobile determined to design and produce a system which would facilitate the classification and computer manipulation of recovered artifacts.

It was initially hoped that this system would be available in time to use for the classification of material from other nineteenth century sites being excavated within the Tombigbee River Multi-Resource District of the Tennessee-Tombigee Waterway. Unfortunately this was not to be since the design and testing of the system took far longer than was originally anticipated. While it was recognized from the beginning that the system was to represent the first step in a classification and retrieval scheme which would evolve through use, the difficulties of producing a working system were underestimated.

Essentially, the system as it now stands has evolved through three phases. The first was the design of the codebook and softeware. The second was a test of the system by coding the artifacts recovered from Colbert, Barton, and Vinton. The third, in part concurrent with the second phase, was the redesign of the codebook, preparation of the manual, and fine tuning of the retrieval software. In fact, the lessons learned in coding pointed out some major problems with the categorization and as a result, the codebook was ultimately refined three times. Since the Colbert, Barton and Vinton material was coded under the first and second versions, artifacts coded from these sites are not in conformity with the present system. Further, the software package presented here has not been updated to work with the present version of the codebook and manual although it is compatible with the second version of the codebook published in the project's Phase II report (Minnerly 1983). It is included here to illustrate the capability of computer assisted retrieval. It is hoped that appropriate changes will soon be made in the software package to make it compatible with the present codebook as well as to make it more powerful and efficient in operation.

Designing a universal system for classifying all of nineteenth century material culture that can be used by cataloguers with minimal training is not an easy task. This attempt has had its vocal critics; among these are a number of experts in nineteenth century material culture who have devoted a great deal of energy in reviewing drafts of the codebook and manual. For their criticisms and many useful suggestions, great thanks is due to Bill Adams, Marley Brown, Olive Jones, George Miller, Randy Moir and Tef Roddeffer. It should be understood that these colleagues do not necessarily agree with the categorization suggested, the contents of the manual, nor even the feasibility of the system itself.

Of the Tombigbee Historic Townsites staff, special thanks is due to Bob Sonderman and Randy Donahue who devoted many hours beyond their formal association with the project and to Tia Maxwell, project artist who is responsible for the illustrations in the manual. W. Lee Minnerly, who spearheaded the project to begin with, was instrumental in developing most of the major concepts as well as contributing a major portion of the section on ceramics in the manual. Lee's important contributions are gratefully acknowledged.

Finally and most especially, thanks is due to Kim McBride, editor, typist, coordinator and all around dynamo who is responsible for getting the job done.

C. Cleland
East Lansing
December 10, 1983

Foreword

This volume is the third and final part of the categorization, enumeration, and retrieval system, and is meant to be used in conjunection with Part I, the codebook, and Part II, the codebook manual. However, recent revisions to the codebook and manual, but not the software, present incompatibilities. The version of the codebook to which this software is compatible is published along with the Phase II report of the Tombigbee Historic Townsites Project (Oral Historical, Documentary, and Archaeological Investigations of Barton and Vinton, Mississippi: An Interim Report on Phase II of the Tombigbee Historic Townsites Project, edited by W. Lee Minnerly). Desite the incompatibilities occasioned by recent changes in the codebook and manual, the manual itself should still be of some use with the earlier version of the codebook.

A further warning to the reader concerns the structure of the data files, which renders the program expensive to run, and the need for revisions to facilitate analytical research. Suggestions for improvement appear in Section 7.0 of this report.

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1.0 INTRODUCTION

The Tombigbee Historic Townsites Project Archaeological Information System (AIS) was developed between 1980 and 1982 by Dr. Robert I. Wittick and Mr. Randolph E. Donahue of Michigan State University. The AIS is an interactive retrieval system for site and artifact information collection by the Tombigbee Historic Townsites Project between 1979 and 1981, and it was developed for use on the Michigan State University Control Data Corporation Cyber 170 series, model 750, computer. Although the system is highly portable to other computer facilities, all instructions in this report refer to its use at MSU.

The AIS manipulates hierarchically structured data files and prints out the desired information according to the set of commands presented by the user. The AIS program prompts the user for each required piece of information, thus making it a very easy retrieval system to use even by those unfamiliar with computers. Given the size of the files being manipulated, the AIS is very rapid and can process data as fast as the terminal can print the information. Options for having the data stored for later printing or for having the data printed at a high speed "batch" printer are also presented in this report.

The data are structured in a hierarchical arrangement of ten levels: spatial provenience data include site, unit, stratigraphic level, feature, subfeature, and area information, and artifact typology data include material category, material subcategory, artifact category information. Section 4.0 presents various selection options for these ten levels.

2.0 USE OF THE AIS

The AIS was written with emphasis on convenient interactive use. Nevertheless, it can be used from batch (card input) or from a terminal with the output disposed to batch for high speed printing. The procedure for using the AIS can be divided into two parts, system control statements that tell the computer what to do, and program command statements that tell the AIS program what information the user wants.

3.0 SYSTEM CONTROL STATEMENTS

Users of the CDC computer at Michigan State are required to have a valid problem number and for batch use, a problem number card (PNC). Applications are available from the Computer Laboratory, Room 220, Computer Center.

3.1 INPUT AND OUTPUT VIA TERMINAL

This is the most convenient but most expenstive way to use the AIS system. If a large quantity of information is being retrieved, one of the alternative approaches is suggested. The user must first link up the terminal with the computer such as by telephone and modem; the current telephone number is 353-8555. Direct line terminals are also available in Room 208, Computer Center. The user will be requested to enter the password, problem number, and user identification; this information is presented to the user when the problem number application is returned. The user should remember that at a terminal, every line entered must be followed by the RETURN key. Once successfully logged in, the computer will prompt the user with READY and the time. The following lines should be entered.

```
RTL,60.
ATTACH,AIS,AIS,PW=AIS.
AIS.
```

The user now begins interacting with the AIS program, where program commands will be requested. When the AIS is stopped and the user is completely finished, the following statement should be entered:

```
LOGOUT,T.
```

3.2 PROCEDURE FOR BATCH OUTPUT VIA TERMINAL

At times the user will only have access to a CRT (nonprinting) terminal or will have a large amount of output to be printed. Using the program for batch output will resolve the first problem and reduce time and cost of the second. The following control statements must be entered after logging-in:

```
RTL,60.
PROMPT.
ATTACH,AIS,AIS,PW=AIS.
AIS,DATA.
.
.
        Program command statements are entered here as in
        Section 3.1. Only asterisks will be printed to
        inform the user that input is required.
.
.
.
REWIND,DATA.
DISPOSE,DATA,PR=B.
LOGOUT,T.
```

A sequence number is printed after the Dispose statement. This number is used to locate the output, which is filed according to the last three digits in Room 208, Computer Center. Be sure to copy this number down.

With this method, the user has various options for handling the output. Various alternative dispositions are available as well as cataloging the output for later printing. These alternative means for handling the output file are discussed in the Michigan State University User's Guide to the Interactive System.

3.3 BATCH INPUT AND OUTPUT

If the user is not in a hurry for the output, this approach can be most cost effective. The user submits the system control statements and program command statements with computer cards. The deck for performing this routine should contain the following cards:

```
Sequence Card
PNC (Problem Number Card).
Job Card
Password Card
ATTACH,AIS,AIS,PW=AIS.
AIS.
7/8/9
.
.
.
Command statements
.
.
.
6/7/8/9
```

The sequence card is provided in Room 208, Computer Center, and contains the number the output is filed under in that room. The next card is the problem number card and the following card contains the user's identification starting in column 1, followed by a set of parameters, separated by commas, that set limits to the potential cost of the run. An average run will require the following parameters:

```
Id ,CM60000,JC500,L50,T30,RG2.
```

Discussion of these parameters is found in the Michigan State University Guide to the Scope/Hustler System. The password card contains PW= "User's Password" starting in column 1. The 7/8/9, 6/7/8/9 cards contain these numbers multipunched in column 1.

4.0 PROGRAM COMMAND STATEMENTS

The same set of questions is always presented to the user unless either material categories I or II is selected. The user should have a good understanding of allowable commands at each level of the hierarchy and should know exactly which commands are required for any given run. This alone will eliminate almost all possible errors. After the program begins executing, it will request information for each hierarchic level. Table 1 presents a brief description of allowable inputs at each level. It should be remembered that only for input and output at a terminal (Section 3.1) will actual questions be presented requesting the next piece of information. Thus, one must know the order and number of commands required by the other methods. The command sequence follows that found in Table 1.

After requesting the type of header record, the information will be printed at the terminal unless batch output was requested. In all cases, however, the system returns to the beginning and requests a site designation or "STOP." If the user is finished, then by entering STOP the user will be exited from program control to computer system control. Alternatively, the user can continue retrieving information by entering a site designation. Examples of various ways of requesting information are presented in Appendix A.

5.0 RETRIEVAL OF DATA FILES FROM TAPE

The Tombigbee Historic Townsites Project data files contain a large quantity of site and artifact information. This massive amount of data is stored at MSU in two ways: on disk and on magnetic tape. Disk storage is much more convenient than tape storage because it allows immediate access to the data when one requests the file on which that information is found. But because disk storage is very expensive for large quantities of data, tape storage is a valuable option. However, the user must know how to transfer information from tape to disk.

The user will discover whether the information desired is on disk after entering the program command of the site number. If not available, the computer will respond with "REQUESTED SITE (#) NOT ON SYSTEM." Be sure that the site number wanted is the one requested and not a typographical error. To save costs, one should also be aware of which other sites will contain desired information so that all site data files can be requested at one time. Files once retrieved will be available for 15 days. There are two ways of retriving files from tapes, by batch and by terminal.

5.1 RETRIEVAL OF FILES FROM TAPE VIA BATCH

The following cards are required. A description of most of them is presented in Section 3.2.

```
Sequence Card
PNC
Id ,NT1,JC2000,CM60000,RG2,T10.
PW= Password
PFLOAD,NT=1933, I=INPUT
7/8/9
.
.
.
```

A list of all site numbers desired prefixed by the letter E and beginning in Column 1. Example:

Table 1. Sequence of program commands.

Hierarchic level of input request	Range of acceptable values	Location of input values
Site	4 digit integer of STOP	Appendix B
Unit	1 to 3 digit integer or ALL	Appendix B
Level	1 or 2 digit integer or ALL	Appendix B
Feature	1 to 3 digit integer or ALL	Appendix B
Subfeature	1 to 3 digit integer or ALL	Appendix B
Area	1 digit integer or ALL	Appendix B
Material Category	Roman numeral between I and XII or ALL	Appendix C
Material Subcategory (requested only if material category is I or II)	letter A to E or ALL	Appendix D
Artifact Category	2 digit integer or ALL	Appendix D
Artifact Subcategory	3 digit integer or ALL	Appendix D
Full Header Records	YES or NO	

```
          E4999
          .
          .
          .
          6/7/8/9
```

Be sure to include the parameter NT=1 in the Jobcard or the program will not retrieve the files.

5.2 RETRIEVAL OF FILES FROM TAPE BY TERMINAL

To perform this task at the terminal, the user should first log in and then enter the following control statements:

```
          SYSTEM BATCH.
          N,100.
          *JOBCARD*,T10,RG2,NT1,JC2500.
          PFLOAD,NT=UP1993,I=INPUT
          *EOS
          .
          .
          .
                  Each site desired is entered line by line prefixed
                  by the letter E.  Example:
          E5200
          .
          .
          .
          *EOI
          =
          GO.
          LOGOUT,T.
```

A sequence number will be presented after "GO." It refers to a printout filed in Room 208, Computer Center. It will inform the user if the retrieval was successful.

6.0 TECHNICAL INFORMATION AND PROGRAMMERS

AIS version 1.0 and all peripheral programs are written in CDC Fortran version 5.0, an extended version of Fortran 77 described in ANSI document X.9-1978. A brief description of each program important to the operation and maintenance of the AIS is presented below. Tables 2 and 3 provide some brief but critical information concerning the program and data files.

6.1 PROGRAM EXC

This is the heart of the retrieval system, and it is the only program required by users of the AIS (see Appendix A, Section 2).

Table 2. Program files.

Program Name	Permanent File Name	Passwords	Status

EXC	AIS	CN=TOM
		EX=BIG
		MD=BEE
		TK=AIS
			Binary file

EXC	AISEW	TK=TOM	Editor work file
CRFL	ACRONYMPROGRAM	TK=TOM	Coded file
SITES	LGOSITES	TK=TOM	Relative file
SITES	SITESEW	TK=TOM	Editor work file
SITES	SITES	TK=TOM	Coded file
HEADERS	LGOHEADERS	TK-TOM	Relative file
HEADERS	HEADERLISTPROGRAM	TK=TOM	Coded file

Table 3. Data files.

Permanent File Name	Passwords	Status	Program(s) Input	Program Output	Contents
TAPE-FILE PN-MU15916	--	--	DUMPN	--	System derived file for manipulating tapes.
ACRONYMS	TK=TOM	Coded, Sequential access file	CRFL	--	Artifact codes and acronyms.
TAPE2ACRONYMSFILE	TK=TOM	Coded, Random access file	EXC	CRFL	Artifact codes: and acronyms.
TAPE3ACRONYMSFILE	TK=TOM	Coded, Random access file	EXC	CRFL	Index, artifac code, and material code.
E____ (four digit site file #)	None	Coded, Sequential access file	EXC SITES & HEADERS	--	Artifact codes and header records.

Three data files are manipulated by the program: TAPE1, the excavation data; and TAPE2 and TAPE3, which contain information allowing for the writing of the acronyms. These two data files are random accessed files produced by Program CRFL (Section 6.2). Program EXC requires approximately 50K and can process approximately 250 data records per second of central processing time. This varies greatly depending on the frequency of header records.

The main program attaches necessary files, reads the data file, determines what kind of line of code is presented, which subroutine it should use for interpreting that line, and prints the output file. Subroutine PRIHD is used for printing complete headers while Subroutine PRIPHD is used for printing partial headers.

Subroutine PARMS requests command statements. It uses Subroutine FIND to insure the value entered will be equivalent to that requested by counting the number of characters entered. It then uses Subroutine PACK to combine the characters into a single character string variable.

Subroutine HEADER decodes the header statements with the use of Subroutine PACK, which recombines characters into a character string variable. Subroutine CODER deciphers the artifact categories and subcategories. It also uses Subroutine PACK to recombine the characters into a character string variable. Subroutine MAJOR interprets material category codes. Subroutine LETTER interprets the material subcategory codes if Roman numeral I or II is selected at the level of material category (See Appendix A, Section 2).

6.2 PROGRAM CRFL

This program produces the random access tape files used by Program EXC from a sequential file containing the artifact codes and their corresponding acronyms. TAPE1 is the acronyms input file while TAPE2 and TAPE3 are the random access output files (see Table 3). The program flow is self-explanatory. See Appendix A, Section 2 for a listing of the program.

6.3 PROGRAM SITES

This program combines data of selected unit numbers from input files TAPE3 into a single output file TAPE4. The unit numbers are requested from input at the start of the program. This program allows users to combine data from numerous files into a single file, which can then be catalogued. The flow of this program is self-explanatory. A listing can be found in Appendix A, Section 2.

6.4 PROGRAM HEADERS

This very simple program reads through a data file (TAPE3) and writes out all header records on TAPE4 in the same format. The site number (file number) is printed at the top of each listing. An indefinite number of files can be processed at one time. The flow of this program is self-explanatory. A copy of the program is found *in Appendix A, Section 2.*

6.5 LOCATION OF PROGRAM AND DATA FILES AT MSU

All program files and data files are located on nine track tapes UP1992 and UP1993. Files were originally manipulated between tapes and disk using MSU system routine DUMPN. For information concerning DUMPN and the corresponding retrieval program GETPF, refer to the following on-line documentation:

```
HELP,L*UNSUP,F*DUMPN.
HELP,L*UNSUP,F*GETPF.
```

PFLOAD commands are adequate for retrieving these files as well.

7.0 SUGGESTED FUTURE IMPROVEMENTS FOR THE AIS

Many of the following suggestions result from discussions the author has had with Dr. Robert I. Wittick, Director of User Services, MSU Computer Laboratory. Dr. Wittick wrote most of the Program EXC and produced an efficient routine for retrieving coded data and presenting that information in a form understandable to anybody wanting to work with it. On the other hand, the data structure was designed elsewhere and is difficult to manipulate and decode. This has kept the overall system far below its potential level of cost-effectiveness.

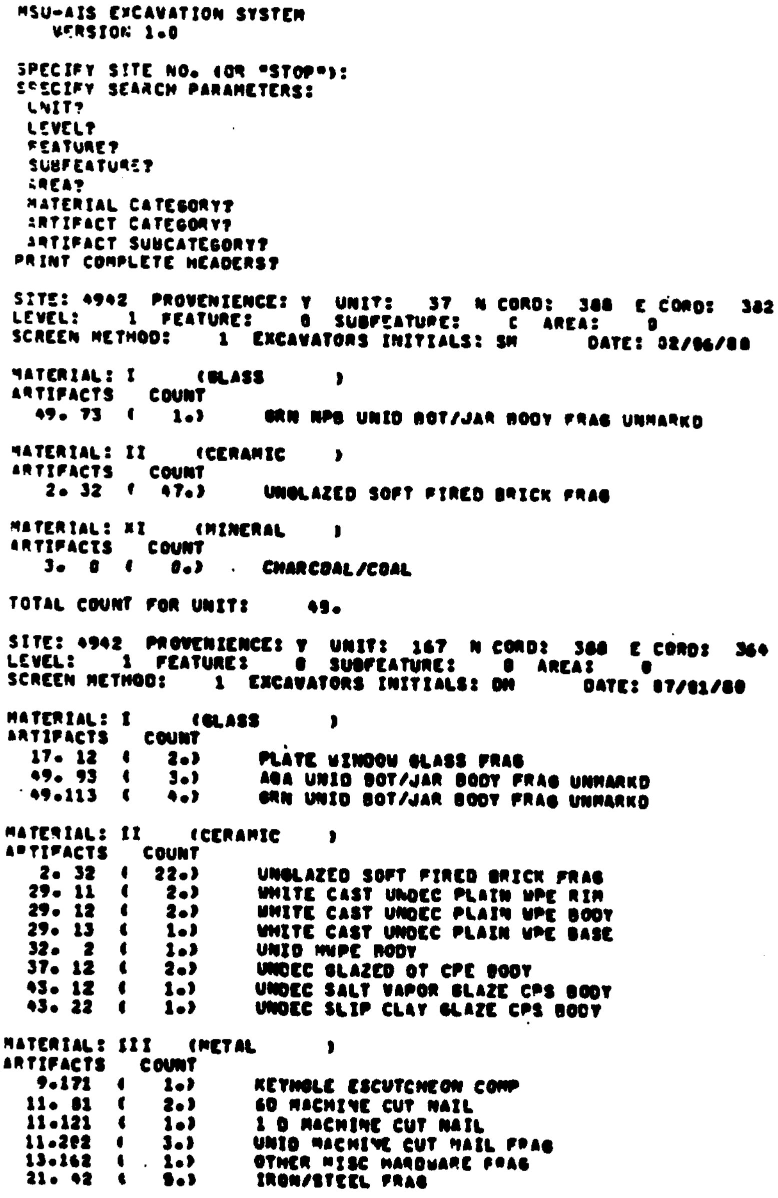
The one major change suggested here is to restructure the data into a fixed format structure, perhaps with code numbers in filed 1 to indicate the type of data record presented. This would require modification of Program EXC (and most others as well). It is estimated that the size of Program EXC could be reduced 50% or more and its efficiency at least doubled. The change in the data structure would also allow for a 50% reduction in storage costs because the current structure has each artifact category code and its frequency on separate records; these can easily be shifted to one record.

Another important addition to the AIS is a data entry program that would significantly reduce errors, thus reducing editing costs. This program would be a very simple program to write. There is one other very necessary program that would require much work. This is a program that would restructure requested data into a format accepted by major analytical packages like SPSS, Clustan and Geosys. Without such a program, researchers are limited to obtaining data listings, exactly what a retrieval system does, but not adequate for scientific research. While discussed as separate programs, there is no reason why these additional routines cannot be overlays or subroutines of Program EXC. It should be remembered that every program written to manipulate the data files will be costly to run as long as the files remain in their current structure.

APPENDIX A, Section 1

Example Run

```
TOTAL COUNT FOR UNIT:      54.

SITE: 4942  PROVENIENCE: Y  UNIT:  167  N CORD:  388  E CORD:  354
LEVEL:     2  FEATURE:     0  SUBFEATURE:     0  AREA:     0
SCREEN METHOD:    12  EXCAVATORS INITIALS: CH        DATE: 07/01/80

MATERIAL: I      (GLASS       )
ARTIFACTS   COUNT
  17. 12  (    3.)      PLATE WINDOW GLASS FRAG
  49. 33  (    1.)      CLR NPB UNID BOT/JAR BODY FRAG UNMARKD
  49.113  (    3.)      GRN UNID BOT/JAR BODY FRAG UNMARKD
  62.122  (    1.)      PB UNDEC UNID TABLWARE FRAG BODY
  62.123  (    1.)      PB UNDEC UNID TABLWARE FRAG BASE/STEM

MATERIAL: II     (CERAMIC     )
ARTIFACTS   COUNT
   2. 22  (    2.)      GLAZED SOFT FIRED BRICK FRAG
   2. 32  (   15.)      UNGLAZED SOFT FIRED BRICK FRAG
  14.  2  (    1.)      EDGE DEC WPE BODY
  29. 12  (    1.)      WHITE CAST UNDEC PLAIN WPE BODY
  43. 22  (    1.)      UNDEC SLIP CLAY GLAZE CPS BODY
  43. 22  (    1.)      UNDEC SLIP CLAY GLAZE CPS BODY
  46.  1  (    1.)      UNDEC AND GLAZED PORCELAIN RIM

MATERIAL: III    (METAL       )
ARTIFACTS   COUNT
  11.202  (    2.)      UNID MACHINE CUT NAIL FRAG
  21. 92  (    2.)      IRON/STEEL FRAG

TOTAL COUNT FOR UNIT:      35.

SITE: 4942  PROVENIENCE: Y  UNIT:  169  N CORD:  390. E CORD:  320
LEVEL:     1  FEATURE:     0  SUBFEATURE:     9  AREA:     0
SCREEN METHOD:     1  EXCAVATORS INITIALS: JU        DATE: 07/01/80

MATERIAL: I      (GLASS       )
ARTIFACTS   COUNT
  17. 12  (    4.)      PLATE WINDOW GLASS FRAG
  49. 83  (    1.)      OOG UNID BOT/JAR BODY FRAG UNMARKD

MATERIAL: II     (CERAMIC     )
ARTIFACTS   COUNT
   2. 32  (    1.)      UNGLAZED SOFT FIRED BRICK FRAG
  29. 12  (    1.)      WHITE CAST UNDEC PLAIN WPE BODY

TOTAL COUNT FOR UNIT:       7.

SITE: 4942  PROVENIENCE: Y  UNIT:  170  N CORD:  389  E CORD:  348
LEVEL:     1  FEATURE:     0  SUBFEATURE:     0  AREA:     0
SCREEN METHOD:     1  EXCAVATORS INITIALS: WB  JL  DATE: 07/01/80

MATERIAL: I      (GLASS       )
ARTIFACTS   COUNT
   3. 11  (    1.)      GLASS BUTTON SEW-THROUGH COMP
   9. 22  (    2.)      GLASS LAMP CHIMNEY FRAG
  17. 12  (    7.)      PLATE WINDOW GLASS FRAG
  39. 24  (    1.)      CLR PB BOT/JAR LPNK FRAG UNID
  39. 74  (    1.)      GRN NPB UNID BOT/JAR LPNK FRAG UNID
  49. 23  (    7.)      CLR PB UNID BOT/JAR BODY FRAG UNMARKD
  49. 33  (   17.)      CLR NPB UNID BOT/JAR BODY FRAG UNMARKD
  49. 63  (    2.)      GRN PB UNID BOT/JAR BODY FRAG UNMARKD
```



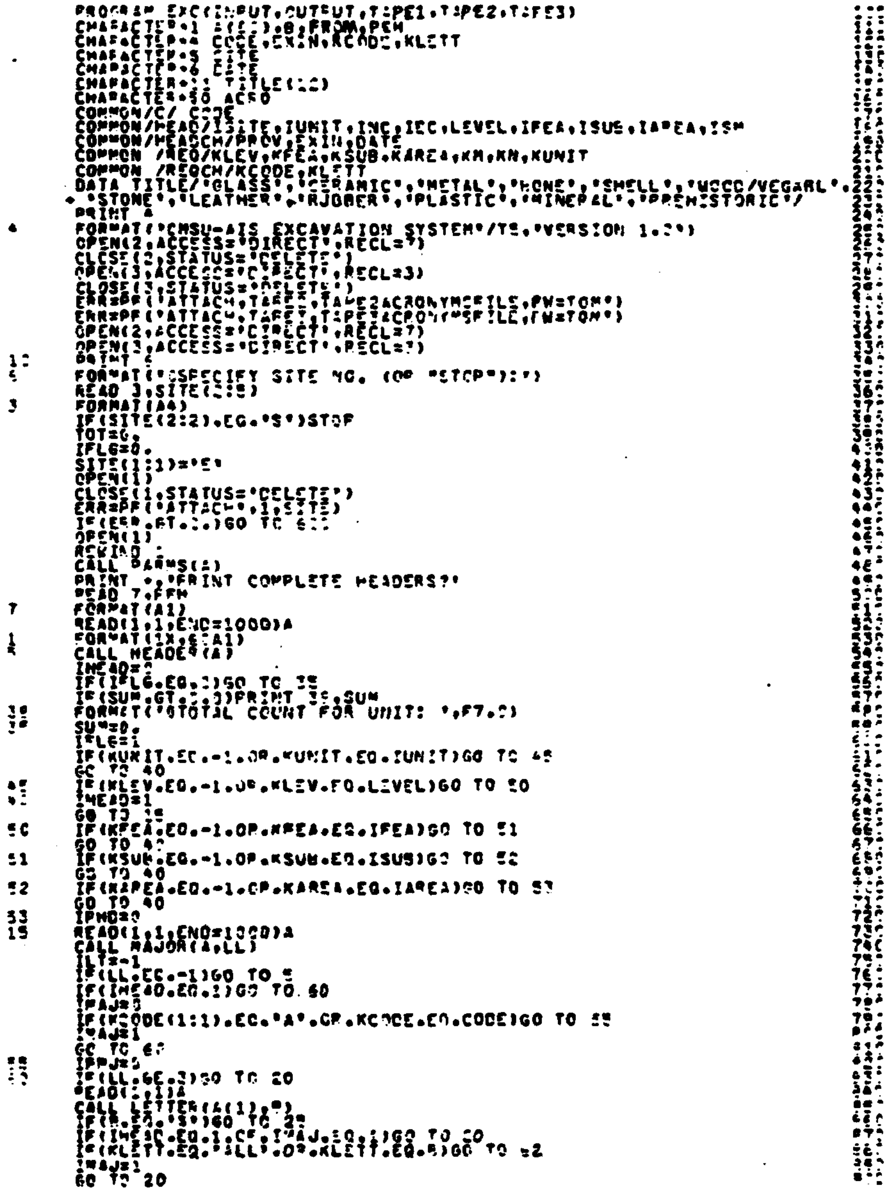
```
MSU-AIS EXCAVATION SYSTEM
   VERSION 1.0

SPECIFY SITE NO. (OR "STOP"):
SPECIFY SEARCH PARAMETERS:
 UNIT?
 LEVEL?
 FEATURE?
 SUBFEATURE?
 AREA?
 MATERIAL CATEGORY?
 ARTIFACT CATEGORY?
 ARTIFACT SUBCATEGORY?
PRINT COMPLETE HEADERS?

SITE: 4942  PROVENIENCE: Y  UNIT:   37  N CORD:  388  E CORD:  382
LEVEL:    1  FEATURE:    0  SUBFEATURE:    C  AREA:    0
SCREEN METHOD:    1  EXCAVATORS INITIALS: SM      DATE: 02/06/80

MATERIAL: I      (GLASS        )
ARTIFACTS   COUNT
  49. 73  (    1.)     BRN NPB UNID BOT/JAR BODY FRAG UNMARKD

MATERIAL: II     (CERAMIC     )
ARTIFACTS   COUNT
   2. 32  (   47.)     UNGLAZED SOFT FIRED BRICK FRAG

MATERIAL: XI     (MINERAL     )
ARTIFACTS   COUNT
   3. 0  (    0.)   .  CHARCOAL/COAL

TOTAL COUNT FOR UNIT:     49.

SITE: 4942  PROVENIENCE: Y  UNIT:  167  N CORD:  388  E CORD:  364
LEVEL:    1  FEATURE:    0  SUBFEATURE:    0  AREA:    0
SCREEN METHOD:    1  EXCAVATORS INITIALS: DM      DATE: 07/01/80

MATERIAL: I      (GLASS        )
ARTIFACTS   COUNT
  17. 12  (    2.)     PLATE WINDOW GLASS FRAG
  49. 93  (    3.)     AQA UNID BOT/JAR BODY FRAG UNMARKD
  49.113  (    4.)     BRN UNID BOT/JAR BODY FRAG UNMARKD

MATERIAL: II     (CERAMIC     )
ARTIFACTS   COUNT
   2. 32  (   22.)     UNGLAZED SOFT FIRED BRICK FRAG
  29. 11  (    2.)     WHITE CAST UNDEC PLAIN WPE RIM
  29. 12  (    2.)     WHITE CAST UNDEC PLAIN WPE BODY
  29. 13  (    1.)     WHITE CAST UNDEC PLAIN WPE BASE
  32.  2  (    1.)     UNID MWPE BODY
  37. 12  (    2.)     UNDEC GLAZED OT CPE BODY
  43. 12  (    1.)     UNDEC SALT VAPOR GLAZE CPS BODY
  43. 22  (    1.)     UNDEC SLIP CLAY GLAZE CPS BODY

MATERIAL: III    (METAL        )
ARTIFACTS   COUNT
   9.171  (    1.)     KEYHOLE ESCUTCHEON COMP
  11. 81  (    2.)     6D MACHINE CUT NAIL
  11.121  (    1.)     1 D MACHINE CUT NAIL
  11.202  (    3.)     UNID MACHINE CUT NAIL FRAG
  13.162  (    1.)     OTHER MISC HARDWARE FRAG
  21. 42  (    9.)     IRON/STEEL FRAG
```

```
   1. 12  (    1.)      MODIFIED LITHIC FRAG
   1. 22  (    1.)      DEBITAGE FRAG
   1. 42  (    1.)      FIRE CRACKED ROCK FRAG

TOTAL COUNT FOR UNIT:     567.

SITE: 4942  PROVENIENCE: Y  UNIT:  170  N CORD:  3C4  E CORD:  349
LEVEL:     2  FEATURE:     0  SUBFEATURE:     0  AREA:     0
SCREEN METHOD:     1  EXCAVATORS INITIALS: WB  JL  DATE: 07/01/80

MATERIAL: I      (GLASS        )
ARTIFACTS    COUNT
   3. 11  (    3.)      GLASS BUTTON SEW-THROUGH COMP
  17. 12  (    2.)      PLATE WINDOW GLASS FRAG
  39. 34  (    1.)      CLR NPB BOT/JAR LPNK FRAG UNID
  49. 23  (    6.)      CLR PB UNID BOT/JAR BODY FRAG UNMARKD
  49. 33  (    7.)      CLR NPB UNID BOT/JAR BODY FRAG UNMARKD
  39. 35  (    2.)      CLR NPB UNID BOT/JAR BASE FRAG, UNID
  61. 22  (    1.)      PB PRESSED-MOLDED OT VSSL FRAG BODY

MATERIAL: II     (CERAMIC      )
ARTIFACTS    COUNT
   2. 22  (    3.)      GLAZED SOFT FIRED BRICK FRAG
   2. 32  (   61.)      UNGLAZED SOFT FIRED BRICK FRAG
  16. 32  (    1.)      PAINTED POLYCHROME WPE BODY
  17. 42  (    1.)      PRINTED PURPLE WPE BODY
  29. 12  (    4.)      WHITE CAST UNDEC PLAIN WPE BODY
  37. 12  (    2.)      UNDEC GLAZED OT CPE BODY
  40.  2  (    1.)      UNDEC WPS BODY
  43. 22  (    1.)      UNDEC SLIP CLAY GLAZE CPS BODY
  46.  1  (    1.)      UNDEC AND GLAZED PORCELAIN RIM

MATERIAL: III    (METAL        ).
ARTIFACTS    COUNT
  11. 91  (    1.)      7D MACHINE CUT NAIL
  11.101  (    1.)      8D MACHINE CUT NAIL
  11.131  (    1.)      12D MACHINE CUT NAIL
  11.202  (   73.)      UNID MACHINE CUT NAIL FRAG
  13.161  (    1.)      OTHER MISC HARDWARE COMP
  13.162  (    1.)      OTHER MISC HARDWARE FRAG
  16.172  (    1.)      TABLESPOON FRAG

MATERIAL: IV     (BONE         )
ARTIFACTS    COUNT
  12.  2  (    1.)      UNMODIFIED FRAG

MATERIAL: VII    (STONE        )
ARTIFACTS    COUNT
   6.  2  (    6.)      SLATE BOARD FRAG

MATERIAL: XII    (PREHISTORIC)
ARTIFACTS    COUNT
   1. 42  (    1.)      FIRE CRACKED ROCK FRAG

TOTAL COUNT FOR UNIT:     184.

SITE: 4942  PROVENIENCE: Y  UNIT:  171  N CORD:  372  E CORD:  366
LEVEL:     1  FEATURE:     0  SUBFEATURE:     0  AREA:     0
SCREEN METHOD:     1  EXCAVATORS INITIALS: LS       DATE: 07/01/80

MATERIAL: I      (GLASS        )
```

```
  49. 73  (    5.)     GRN NPB UNIC BOT/JAR BODY FRAG UNMARKD
  49. 93  (    1.)     DOG UNID BOT/JAR BODY FRAG UNMARKD
  49. 83  (    3.)     DOG UNID BOT/JAR BODY FRAG UNMARKD
  49.113  (    3.)     GRN UNID BCT/JAR BODY FRAG UNMARKD
  59. 35  (    2.)     CLR NPB UNID BOT/JAR BASE FRAG, UNID
  59. 95  (    1.)     ABA UNID BOT/JAR BASE FRAG, UNID
  61.131  (    1.)     NPB UNDEC OT VSSL FRAG RIM/NECK
  62.123  (    2.)     PR UNDEC UNID TABLWARE FRAG BASE/STEM
  64. 22  (    4.)     CLR PS UNID GLS FRAG UNDEC

MATERIAL: II    (CERAMIC    )
ARTIFACTS   COUNT
   2. 22  (    4.)     GLAZED SOFT FIRED BRICK FRAG
   2. 32  ( 178.)      UNGLAZED SOFT FIRED BRICK FRAG
   8.192  (    1.)     UNDEC/UNMARKD STONEWARE DETACH STEM PIPE FRAG
  16. 23  (    1.)     PAINTED OT MONOCHROME WPE BASE
  17. 92  (    7.)     PRINTED FLOWED WPE BODY
  29. 11  (    1.)     WHITE CAST UNDEC PLAIN WPE RIM
  29. 12  (   21.)     WHITE CAST UNDEC PLAIN WPE BODY
  29. 13  (    2.)     WHITE CAST UNDEC PLAIN WPE BASE
  40.  1  (    2.)     UNDEC WPS RIM
  40.  2  (    1.)     UNDEC WPS BODY
  40.  4  (    1.)     UNDEC WPS OT
  43. 12  (    1.)     UNDEC SALT VAPOR GLAZE CPS BODY
  43. 22  (    6.)     UNDEC SLIP CLAY GLAZE CPS BODY
  43. 23  (    1.)     UNDEC SLIP CLAY GLAZE CPS BASE
  46.  1  (    1.)     UNDEC AND GLAZED PORCELAIN RIM

MATERIAL: III   (METAL      )
ARTIFACTS   COUNT
   7.222  (    2.)     OTHER CONTAINER FRAG
   7.222  (    1.)     OTHER CONTAINER FRAG
   8.302  (    1.)     WIRE STAPLE FRAG
  11. 41  (    1.)     2D MACHINE CUT NAIL
  11. 51  (    5.)     3D MACHINE CUT NAIL
  11. 61  (    4.)     4D MACHINE CUT NAIL
  11. 71  (    2.)     5D MACHINE CUT NAIL
  11. 81  (   11.)     6D MACHINE CUT NAIL
  11.101  (    5.)     8D MACHINE CUT NAIL
  11.111  (    2.)     9D MACHINE CUT NAIL
  11.121  (    2.)     1 D MACHINE CUT NAIL
  11.202  ( 221.)      UNID MACHINE CUT NAIL FRAG
  13. 22  (    1.)     CHAIN FRAG
  16.152  (    1.)
  21. 42  (   14.)     IRON/STEEL FRAG

MATERIAL: IV    (BONE       )
ARTIFACTS   COUNT
  12.  2  (    3.)     UNMODIFIED FRAG

MATERIAL: V     (SHELL      )
ARTIFACTS   COUNT
   5.  2  (    6.)     UNMODIFIED FRAG

MATERIAL: X     (PLASTIC    )
ARTIFACTS   COUNT
   7.  1  (    1.)     OTHER COMP

MATERIAL: XII   (PREHISTORIC)
ARTIFACTS   COUNT
   1. 11  (    1.)     MODIFIED LITHIC COMP
```

APPENDIX A, Section 2

Program Listings

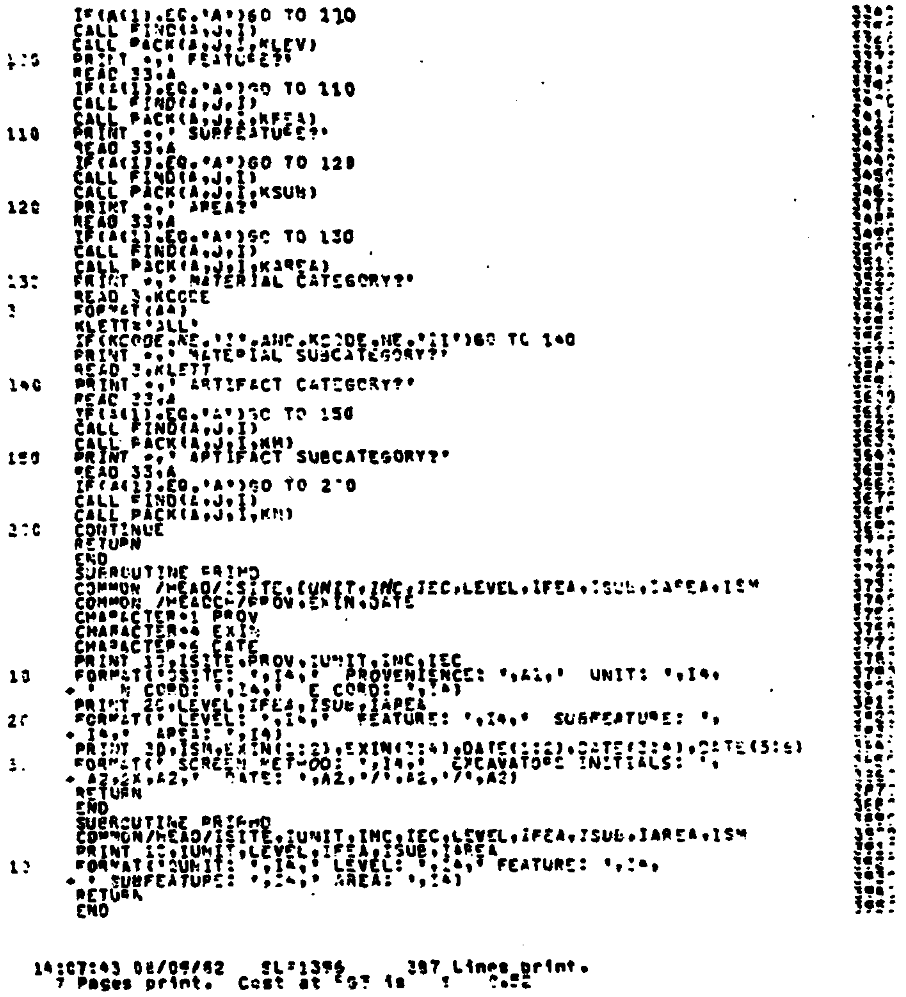


```
      PROGRAM EXC(INPUT,OUTPUT,TAPE1,TAPE2,TAPE3)
      CHARACTER*1 A(80),B,FROM,PRH
      CHARACTER*4 CODE,EXIN,KCODE,KLETT
      CHARACTER*5 SITE
      CHARACTER*6 SITE
      CHARACTER*11 TITLE(12)
      CHARACTER*50 ACRO
      COMMON/C/ CODE
      COMMON/HEAD/ISITE,IUNIT,INC,IEC,LEVEL,IFEA,ISUB,IAREA,ISM
      COMMON/HEADCH/PROV,EXIN,DATE
      COMMON /REQ/KLEV,KFEA,KSUB,KAREA,KM,KN,KUNIT
      COMMON /REQCH/KCODE,KLETT
      DATA TITLE/'GLASS','CERAMIC','METAL','BONE','SHELL','WOOD/VEGTBL',
     + 'STONE','LEATHER','RUBBER','PLASTIC','MINERAL','PREHISTORIC'/
      PRINT 4
4     FORMAT('0MSU-AIS EXCAVATION SYSTEM'/T5,'VERSION 1.0')
      OPEN(2,ACCESS='DIRECT',RECL=7)
      CLOSE(2,STATUS='DELETE')
      OPEN(3,ACCESS='DIRECT',RECL=3)
      CLOSE(3,STATUS='DELETE')
      ERR=PF('ATTACH,TAPE2,TAPE2ACRONYMSFILE,PW=TOM')
      ERR=PF('ATTACH,TAPE3,TAPE3ACRONYMSFILE,PW=TOM')
      OPEN(2,ACCESS='DIRECT',RECL=7)
      OPEN(3,ACCESS='DIRECT',RECL=7)
10    PRINT 5
5     FORMAT('0SPECIFY SITE NO. (OR "STOP"):')
      READ 3,SITE(2:5)
3     FORMAT(A4)
      IF(SITE(2:2).EQ.'S')STOP
      TOT=0.
      IFLG=0.
      SITE(1:1)='S'
      OPEN(1)
      CLOSE(1,STATUS='DELETE')
      ERR=PF('ATTACH',1,SITE)
      IF(ERR.GT.0.)GO TO 600
      OPEN(1)
      REWIND 1
      CALL PARMS(A)
      PRINT *,'PRINT COMPLETE HEADERS?'
      READ 7,PRH
7     FORMAT(A1)
      READ(1,1,END=1000)A
1     FORMAT(1X,80A1)
2     CALL HEADER(A)
      IHEAD=0
      IF(IFLG.EQ.0)GO TO 35
      IF(SUM.GT.0.0)PRINT 36,SUM
36    FORMAT('0TOTAL COUNT FOR UNIT: ',F7.0)
35    SUM=0.
      IFLG=1
      IF(KUNIT.EQ.-1.OR.KUNIT.EQ.IUNIT)GO TO 45
      GO TO 40
45    IF(KLEV.EQ.-1.OR.KLEV.EQ.LEVEL)GO TO 50
40    IHEAD=1
      GO TO 15
50    IF(KFEA.EQ.-1.OR.KFEA.EQ.IFEA)GO TO 51
      GO TO 40
51    IF(KSUB.EQ.-1.OR.KSUB.EQ.ISUB)GO TO 52
      GO TO 40
52    IF(KAREA.EQ.-1.OR.KAREA.EQ.IAREA)GO TO 53
      GO TO 40
53    IPHD=0
15    READ(1,1,END=1000)A
      CALL MAJOR(A,LL)
      ILT=-1
      IF(LL.EQ.-1)GO TO 2
      IF(IHEAD.EQ.1)GO TO 60
      IMAJ=0
      IF(KCODE(1:1).EQ.'A'.OR.KCODE.EQ.CODE)GO TO 55
      IMAJ=1
      GO TO 60
55    IMAJ=0
60    IF(LL.GE.3)GO TO 20
      READ(1,1)A
      CALL LETTER(A(1),B)
      IF(B.EQ.'S')GO TO 2
      IF(IHEAD.EQ.1.OR.IMAJ.EQ.1)GO TO 20
      IF(KLETT.EQ.'ALL'.OR.KLETT.EQ.B)GO TO 62
      IMAJ=1
      GO TO 20
```

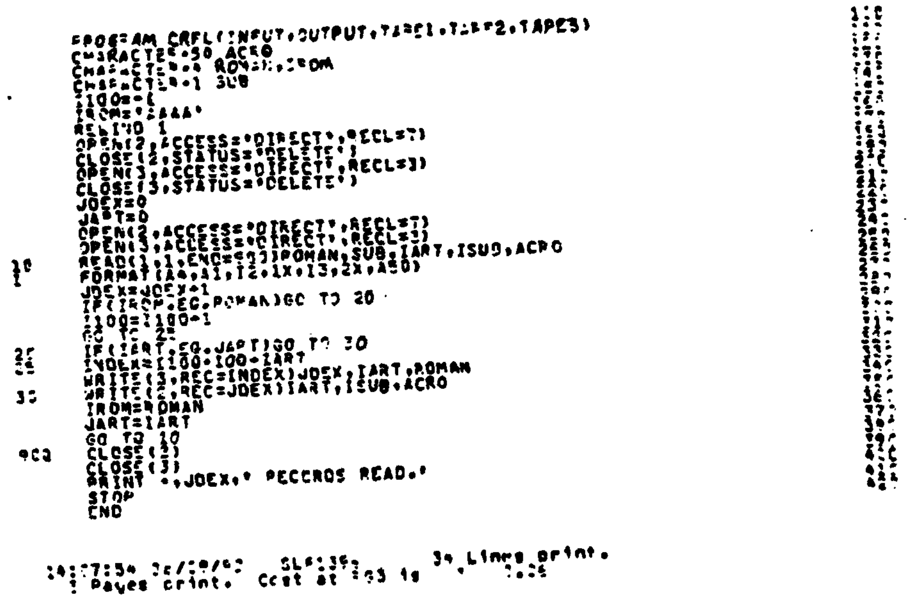
```
10    ILT=0
20    READ(1,1)A
15    CALL CODER(A,M,N)
      IF(M.NE.-1)GO TO 30
      READ(1,1)A
      GO TO 15
30    READ(1,2)Q
2     FORMAT(F5.2)
      IF(IHEAD.EQ.1.OR.IMAJ.EQ.1)GO TO 20
      IF(KM.EQ.-1.OR.KM.EQ.M)GO TO 70
      GO TO 20
70    IF(KN.EQ.-1.OR.KN.EQ.N)GO TO 75
      GO TO 20
75    SUM=SUM+Q
      TOT=TOT+Q
      IF(IPMO.EQ.1)GO TO 76
      IF(PFM.EQ.'Y')CALL PRIMO
      IF(PFM.NE.'Y')CALL PRIPMO
      IPMO=1
76    IF(IPMJ.EQ.1)GO TO 78
      IF(ILT.NE.0)B=' '
      PRINT 77,CODE,B,TITLE(LL)
77    FORMAT('0MATERIAL: ',A4,A1,1X,'(',A11,')'/
     + ' ARTIFACTS    COUNT')
      IPMJ=1
78    INDEX=(LL-4)*100+M
      IF(INDEX.LT.1)GO TO 90
      READ(3,REC=INDEX,ERR=90)JOEX
85    READ(2,REC=JOEX,ERR=90)IAR,IS,ACRO
      IF(IAR.NE.M)GO TO 90
      JOEX=JOEX+1
      IF(N.NE.IS)GO TO 85
      PRINT 82,M,N,Q,ACRO
82    FORMAT(1X,I4,'.',I3,2X,'(',F5.2,')',5X,A50)
      GO TO 20
90    CONTINUE
      PRINT 80,M,N,Q
80    FORMAT(1X,I4,'.',I3,2X,'(',F5.2,')')
      GO TO 20
500   PRINT *,'REQUESTED SITE ',SITE(2:5),' NOT ON SYSTEM.'
      GO TO 10
1000  CLOSE(3,STATUS='DELETE')
      IF(SUM.GT.0.)PRINT 98,SUM
      IF(TOT.GT.0.)PRINT 99,TOT
99    FORMAT('0TOTAL COUNT FOR THIS SEARCH: ',F7.2)
      IF(TOT.EQ.0.0)PRINT 199
199   FORMAT('0SORRY, SEARCH FOUND NOTHING.')
      GO TO 10
      END
      SUBROUTINE HEADER(A)
      COMMON /HEAD/ISITE,IUNIT,INC,IEC,LEVEL,IFEA,ICUS,IAREA,ICM
      COMMON/HEADCH/PROV,EXIN,DATE
      CHARACTER*1 AST,A(63),PROV
      CHARACTER*4 EXIN
      CHARACTER*8 DATE
      DATA AST/'*'/
      K=0
      J=1
      EXIN='    '
      DO 1000 II=1,63
      I=II
      IF(A(I).EQ.' '.AND.K.EQ.0)GO TO 1000
      IF(A(I).EQ.'/') GO TO 12
      IF(A(I).NE. AST)GO TO 1000
      K=K+1
      GO TO (1,2,3,4,5,6,7,8,9,10,11,12),K
1     CALL PACK(A,J,I,ISITE)
      J=I+1
      GO TO 1000
2     PROV=A(I-1)
      J=I+1
      GO TO 1000
3     CALL PACK(A,J,I,IUNIT)
      J=I+1
      GO TO 1000
4     CALL PACK(A,J,I,INC)
      J=I+1
      GO TO 1000
5     CALL PACK(A,J,I,IEC)
      J=I+1
      GO TO 1000
```

```
6       CALL PACK(A,J,I,LEVEL)
        J=I+1
        GO TO 1000
7       CALL PACK(A,J,I,IFFA)
        J=I+1
        GO TO 1000
8       CALL PACK(A,J,I,ISUB)
        J=I+1
        GO TO 1000
9       CALL PACK(A,J,I,IAREA)
        J=I+1
        GO TO 1000
10      CALL PACK(A,J,I,ISN)
        J=I+1
        GO TO 1000
11      KK=I-J
        IF(KK.NE.2.AND.KK.NE.4)STOP 2
        DO 101 L=1,KK
        M=J+L-1
101     EXIN(L:L)=A(M)
        J=I+1
        GO TO 1000
12      KK=I-J
        DO 120 L=1,KK
        M=J+L-1
120     DATE(L:L)=A(M)
        GO TO 1100
1000    CONTINUE
1100    RETURN
        END
        SUBROUTINE PACK(A,J,I,INTX)
        CHARACTER*1 A(60),ONE
        CHARACTER*2 TWO
        CHARACTER*3 THREE
        CHARACTER*4 FOUR
1       CONTINUE
        K=I-J
        IF(K.GT.4)STOP 1
        IF(K.EQ.0)GO TO 50
        GO TO (10,20,30,40),K
10      ONE=A(J)
        READ(ONE,11)INTX
11      FORMAT(I1)
        RETURN
20      DO 21 L=1,2
        M=J+L-1
21      TWO(L:L.=A(M)
        READ(TWO,22)INTX
22      FORMAT(I2)
        RETURN
30      DO 31 L=1,3
        M=J+L-1
31      THREE(L:L)=A(M)
        READ(THREE,32)INTX
32      FORMAT(I3)
        RETURN
40      DO 41 L=1,4
        M=J+L-1
41      FOUR(L:L)=A(M)
        READ(FOUR,42)INTX
42      FORMAT(I4)
        RETURN
50      INTX=0
        RETURN
        END
        SUBROUTINE CODER(A,M,N)
        CHARACTER*1 A(60)
        IF(A(1).EQ.' '.AND.A(4).EQ.' ')GO TO 900
        J=1
        K=0
        DO 20 I=1,60
        IF(A(I).EQ.' ')GO TO 5
        IF(A(I).NE.'.')GO TO 20
        CALL PACK(A,J,I,M)
        J=I+1
        K=1
        GO TO 20
5       IF(K.EQ.1)GO TO 15
        K=1
        CALL PACK(A,J,I,N)
        RETURN
```

```
15     CALL PACK(A,J,I,N)
       RETURN
20     CONTINUE
       RETURN
900    M=-1
       RETURN
       END
       SUBROUTINE MAJOR(A,LL)
       COMMON /C/CODE
       CHARACTER*4 ROMAN(12),CODE
       CHARACTER*1 A(60)
       DATA ROMAN/'I','II','III','IV','V','VI','VII','VIII','IX',
      + 'X','XI','XII'/
       K=0
       CODE='    '
       DO 200 I=1,60
       IF(A(I).NE.' ')GO TO 199
       IF(K.EQ.0)GO TO 200
       M=I-J
       IF(M.GT.4)GO TO 375
       DO 15 L=1,M
       N=L+J-1
15     CODE(L:L)=A(N)
       GO TO 300
199    IF(K.EQ.0)J=I
       K=1
200    CONTINUE
300    DO 350 I=1,12
       IF(CODE.EQ.ROMAN(I))GO TO 400
350    CONTINUE
375    LL=-1
       RETURN
400    LL=I
       RETURN
       END
       SUBROUTINE LETTER(A,B)
       CHARACTER*1 LET(6),A,B
       DATA LET/'A','B','C','D','E','F'/
       DO 20 I=1,6
       IF(A.EQ.LET(I)) GO TO 50
20     CONTINUE
       B='*'
       RETURN
50     B=A
       RETURN
       END
       SUBROUTINE FIND(A,J,I)
       CHARACTER*1 A(60)
       J=1
       L=0
       DO 10 K=1,60
       IF(A(K).EQ.' '.AND.L.EQ.0)GO TO 9
       IF(A(K).NE.' ')GO TO 8
       I=K
       RETURN
8      L=1
       GO TO 10
9      J=J+1
10     CONTINUE
       END
       SUBROUTINE FARMS(A)
       CHARACTER*1 A(60)
       CHARACTER*4 KCODE,KLETT
       COMMON /REQ/KLEV,KFEA,KSUB,KAREA,KM,KN,KUNIT
       COMMON /REQCH/KCODE,KLETT
       KLEV=-1
       KFEA=-1
       KSUB=-1
       KAREA=-1
       KUNIT=-1
       KM=-1
       KN=-1
       PRINT *,'SPECIFY SEARCH PARAMETERS:'
       PRINT *,' UNIT?'
       READ 33,A
       IF(A(1).EQ.'A')GO TO 50
       CALL FIND(A,J,I)
       CALL PACK(A,J,I,KUNIT)
20     PRINT *,' LEVEL?'
33     FORMAT(60A1)
       READ 33,A
```

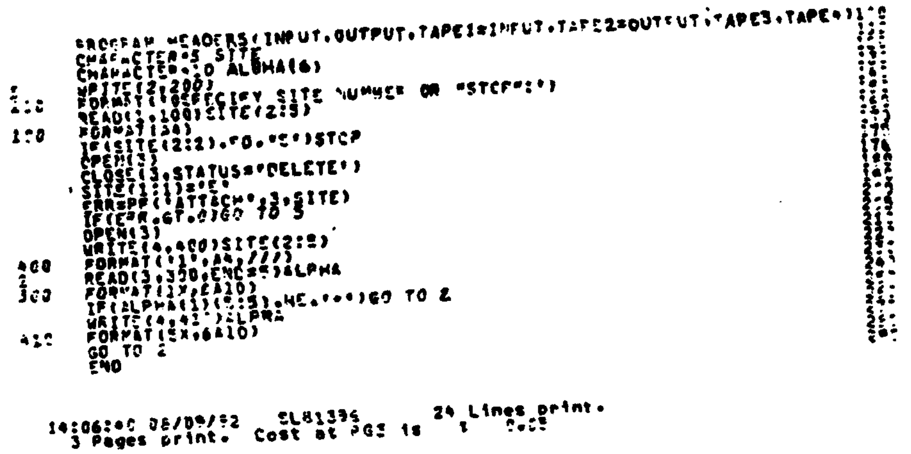


```
      IF(A(1).EQ.'A')GO TO 110
      CALL FIND(A,J,I)
      CALL PACK(A,J,I,KLEV)
100   PRINT *,' FEATURE?'
      READ 33,A
      IF(A(1).EQ.'A')GO TO 110
      CALL FIND(A,J,I)
      CALL PACK(A,J,I,KFEA)
110   PRINT *,' SUBFEATURE?'
      READ 33,A
      IF(A(1).EQ.'A')GO TO 120
      CALL FIND(A,J,I)
      CALL PACK(A,J,I,KSUB)
120   PRINT *,' AREA?'
      READ 33,A
      IF(A(1).EQ.'A')GO TO 130
      CALL FIND(A,J,I)
      CALL PACK(A,J,I,KAREA)
130   PRINT *,' MATERIAL CATEGORY?'
      READ 3,KCODE
3     FORMAT(A4)
      KLETT='ALL'
      IF(KCODE.NE.'I'.AND.KCODE.NE.'II')GO TO 140
      PRINT *,' MATERIAL SUBCATEGORY?'
      READ 3,KLETT
140   PRINT *,' ARTIFACT CATEGORY?'
      READ 33,A
      IF(A(1).EQ.'A')GO TO 150
      CALL FIND(A,J,I)
      CALL PACK(A,J,I,KM)
150   PRINT *,' ARTIFACT SUBCATEGORY?'
      READ 33,A
      IF(A(1).EQ.'A')GO TO 200
      CALL FIND(A,J,I)
      CALL PACK(A,J,I,KN)
200   CONTINUE
      RETURN
      END
      SUBROUTINE PRIHD
      COMMON /HEAD/ISITE,IUNIT,INC,IEC,LEVEL,IFEA,ISUB,IAREA,ISM
      COMMON /HEADCH/PROV,EXIN,DATE
      CHARACTER*1 PROV
      CHARACTER*4 EXIN
      CHARACTER*6 DATE
      PRINT 10,ISITE,PROV,IUNIT,INC,IEC
10    FORMAT(' SITE: ',I4,'  PROVENIENCE: ',A1,'  UNIT: ',I4,
     +'   N CORD: ',I4,'  E CORD: ',I4)
      PRINT 20,LEVEL,IFEA,ISUB,IAREA
20    FORMAT(' LEVEL: ',I4,'  FEATURE: ',I4,'  SUBFEATURE: ',
     + I4,'   AREA: ',I4)
      PRINT 30,ISM,EXIN(1:2),EXIN(3:4),DATE(1:2),DATE(3:4),DATE(5:6)
30    FORMAT(' SCREEN METHOD: ',I4,'  EXCAVATORS INITIALS: ',
     + A2,2X,A2,'  DATE: ',A2,'/',A2,'/',A2)
      RETURN
      END
      SUBROUTINE PRIHD
      COMMON/HEAD/ISITE,IUNIT,INC,IEC,LEVEL,IFEA,ISUB,IAREA,ISM
      PRINT 10,IUNIT,LEVEL,IFEA,ISUB,IAREA
10    FORMAT(' UNIT: ',I4,' LEVEL: ',I4,' FEATURE: ',I4,
     +' SUBFEATURE: ',I4,' AREA: ',I4)
      RETURN
      END

  14:07:43 08/09/82   SL#1396      397 Lines print.
    7 Pages print.  Cost at [illegible]
```



```
      PROGRAM CRFL(INPUT,OUTPUT,TAPE1,TAPE2,TAPE3)
      CHARACTER*50 ACRO
      CHARACTER*4 ROMAN,IROM
      CHARACTER*1 SUB
      I100=-1
      IROM='AAAA'
      REWIND 1
      OPEN(2,ACCESS='DIRECT',RECL=7)
      CLOSE(2,STATUS='DELETE')
      OPEN(3,ACCESS='DIRECT',RECL=3)
      CLOSE(3,STATUS='DELETE')
      JDEX=0
      JART=0
      OPEN(2,ACCESS='DIRECT',RECL=7)
      OPEN(3,ACCESS='DIRECT',RECL=3)
10    READ(1,1,END=900)ROMAN,SUB,IART,ISUB,ACRO
1     FORMAT(A4,A1,I2,1X,I3,2X,A50)
      JDEX=JDEX+1
      IF(IROM.EQ.ROMAN)GO TO 20
      I100=I100+1
      GO TO 25
20    IF(IART.EQ.JART)GO TO 30
25    INDEX=I100*100+IART
      WRITE(3,REC=INDEX)JDEX,IART,ROMAN
30    WRITE(2,REC=JDEX)IART,ISUB,ACRO
      IROM=ROMAN
      JART=IART
      GO TO 10
900   CLOSE(2)
      CLOSE(3)
      PRINT *,JDEX,' RECORDS READ.'
      STOP
      END

 14:27:54 02/10/82   SL#135,   34 Lines print.
   1 Pages print.  Cost at [illegible] is [illegible]
```

```
      PROGRAM SITES(INPUT,OUTPUT,TAPE1=INPUT,TAPE2=OUTPUT,TAPE3,TAPE4)
      CHARACTER*3 UNIT(100)
      CHARACTER*5 SITE
      CHARACTER*6 A(10)
      WRITE(2,220)
220   FORMAT('0ENTER THE NUMBER OF CELLS TO BE ENTERED IN I3 FORMAT:')
      READ(1,120)NUNIT
120   FORMAT(I3)
      DO 10 I=1,NUNIT
      WRITE(2,230)
230   FORMAT('0CELL?')
      READ(1,100)UNIT(I)
100   FORMAT(A3)
10    CONTINUE
8     WRITE(2,200)
200   FORMAT('0SPECIFY SITE NUMBER OR "STOP":')
      READ(1,110)SITE(2:5)
110   FORMAT(A4)
      IF(SITE(2:2).EQ.'S')STOP
      OPEN(3)
      CLOSE(3,STATUS='DELETE')
      SITE(1:1)='L'
      ERR=PF('ATTACH',3,SITE)
      IF(ERR.GT.0)GO TO 8
      OPEN(3)
6     READ(3,300,END=8)A
300   FORMAT(1X,10A6)
      IF(A(1)(5:5).EQ.'*')GO TO 15
      IF(IW.NE.1)GO TO 6
7     WRITE(4,300)A
      GO TO 6
15    IW=1
      NCHAR=4
      IF(A(2)(4:4).EQ.'*')NCHAR=3
      IF(A(2)(3:3).EQ.'*')NCHAR=2
      DO 20 I=1, NUNIT
      IF(A(2)(2:NCHAR).EQ.UNIT(I))GO TO 7
20    CONTINUE
      IW=0
      GO TO 6
      END

 14:36:52 08/19/82   SLS1336       42 Lines print.
   3 Pages print.  Cost at $63 is  $  0.07
```



```
      PROGRAM HEADERS(INPUT,OUTPUT,TAPE1=INPUT,TAPE2=OUTPUT,TAPE3,TAPE4)
      CHARACTER*5 SITE
      CHARACTER*10 ALPHA(6)
5     WRITE(2,200)
200   FORMAT(' SPECIFY SITE NUMBER OR "STOP":')
      READ(1,100)SITE(2:5)
100   FORMAT(A4)
      IF(SITE(2:2).EQ.'S')STOP
      OPEN(3)
      CLOSE(3,STATUS='DELETE')
      SITE(1:1)='S'
      ERR=PF('ATTACH',3,SITE)
      IF(ERR.GT.0)GO TO 5
      OPEN(3)
      WRITE(4,400)SITE(2:5)
400   FORMAT('1',A4,///)
2     READ(3,300,END=5)ALPHA
300   FORMAT(1X,6A10)
      IF(ALPHA(1)(1:5).NE.'   ')GO TO 2
      WRITE(4,410)ALPHA
410   FORMAT(5X,6A10)
      GO TO 2
      END

 14:06:46 08/09/82    CL81396      24 Lines print.
   3 Pages print.  Cost at PGS is   $   0.08
```

APPENDIX C

DEFINITION OF MATERIAL CODES

Material Codes	Material
I	Glass
II	Ceramic
III	Metal
IV	Bone
V	Shell
VI	Wood/Vegetable
VII	Stone
VIII	Leather
IX	Rubber
X	Plastic
XI	Mineral
XII	Prehistoric

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